

CELLULAR TELEPHONE SET, OPERATION CONTROL METHOD THEREOF
AND PROGRAM THEREFOR

CROSS REFERENCE TO THE RELATED APPLICATION

5 The present application has been filed with claiming priority based on Japanese Patent Application No. 2002-292611, filed on October 4, 2002. Disclosure of the above-identified Japanese Patent Application is herein incorporated by reference.

BACKGROUND OF THE INVENTION

10 Field of the Invention

 The present invention relates generally to a cellular telephone set, an operation control method therefor and a program therefor. The invention relates to a cellular telephone set installed a camera and having an image pick-up function, an
15 operation control method therefor and a program therefor.

Description of the Related Art

 Among recent cellular telephone sets, there are some installed cameras and thus having functions for picking-up images, processing the images for storing as album or transmitting to
20 communication counterparts as attachments to electronic mails. As one way of use of such image processing functions, it has been considered to use a picked-up image as memorandum, for example. Namely, it has been considered to pick-up an image of a time-table of public transportation, such as bus, train, sub-way or the
25 like at bus station or train station by means of the camera of the cellular telephone set to store as memorandum for reading out later to check as necessary.

In this case, it is usually not possible to pick-up the image of the overall time-table at one shot of the camera of the cellular telephone set. Therefore, it is typical manner to pick-up the image of one time-table by separate several shots to be stored as a plurality of images. In case of the time-table, there is one for weekday and the other for Sunday and holidays. Therefore, if both time-tables are to be stored, number of the picked-up images to be stored is increased.

Then, it becomes necessary to store a plurality of picked-up images in a memory. In such case, it becomes necessary to perform image pick-up operation and registering operation for each image. On the other hand, upon checking the images dividedly registered, it becomes necessary to read out the registered images one by one. This has been known from Instruction Manual of J-SH08, Basic Operation, pages 50 to 53, issued by J-Phone Kabushiki Kaisha, December, 2001, for example.

When the images of the time-table are picked-up and stored in the memory as memorandum and are read out for checking later, it is inherent to divide the image into a plurality of images to make registering operation and reading out operation troublesome. On the other hand, when the user wants to see one of a plurality of the registered images, for example, when the user wants to see one time zone in the time-table, it becomes difficult to find the desired one of the registered images, to repeat reading out operation until the desired image is displayed. Furthermore, owing to increasing of capacity of built-in memory and adding on of external memory, number of images to be object

for retrieval is increased to inherently increase number of times of reading out operation.

When a plurality of images are registered in the memory, it can be considered an approach to establish correspondence with icons (symbol character) for index for respective registered images for displaying the icons in the upper and/or lower portions of a display screen so that the corresponding icon can be selected when the user selectively reads out the desired image. However, such method requires icons per the registered images to cause increasing of load on the control portion (CPU). Also, number of icons to be displayed on the display screen is limited, number of registered images is also limited accordingly.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a cellular telephone set and operation control method which can make registering and reading out operation of images picked-up memorandum quite simple and thus can reduce user's load.

Another object of the present invention is to provide a cellular telephone set and operation control method which permits reading out of the desired one of a plurality of registered images by quite simple operation.

A further object of the present invention is to provide a cellular telephone set and operation control method which enables registration of a plurality of picked-up images with single icon to prevent increasing number of icons in proportion to number of the registered images.

In order to accomplish the above-mentioned objects,
according to the first aspect of the present invention, a cellular
telephone set having a camera and a display portion comprises:
memory means for registering images picked-up by the camera;
5 and

registration control means for generating an icon
indicating that images are registered upon initially recording
the picked-up images in the memory, displaying the icon on the
display portion, and registering subsequently picked-up images
10 in association with the icon.

The cellular telephone set may further comprise display
control means for controlling to display the icon on the display
portion. Also, the cellular telephone set may further comprise
read-out control means for reading out one of images registered
15 in the memory in response to selecting operation of the icon
on the waiting screen image to display on the waiting screen
image.

The read-out control means may sequentially read out other
images registered in the memory to display on the waiting screen
20 image according to cursor operation on the display portion. A
size of images registered in the memory may be equal to an image
size of the waiting screen image. The memory may have a fixed
capacity. The cellular telephone set as set may further comprise
means for generating an alarm when registration amount in the
25 memory reaches the maximum registration amount of the memory.

According to the second aspect of the present invention,
a method of controlling operation of a cellular telephone set
having a camera and a display portion, comprises:

registration control step of generating an icon indicating that images are registered upon initially recording the picked-up images in a memory, displaying the icon on the display portion, and registering subsequently picked-up images in association
5 with the icon.

The operation control method may further comprise display control step of controlling to display the icon on the display portion. Also, the operation control method may further comprise read-out control step of reading out one of images registered
10 in the memory in response to selecting operation of the icon to display on the waiting screen image.

In the read out control step, other images registered in the memory are sequentially read out to display on the waiting screen image according to cursor operation on the display portion.
15 The size of images registered in the memory may be equal to an image size of the waiting screen image. The operation control method may further comprise step of generating an alarm when registration amount in the memory reaches the maximum registration amount of the memory.

20 According to the third aspect of the present invention, a program for making a computer to execute a method of controlling operation of a cellular telephone set having a camera and a display portion, comprises:

registration control step of generating an icon indicating
25 that images are registered upon initially recording the picked-up images in a memory, displaying the icon on the display portion, and registering subsequently picked-up images in association with the icon.

Operation of the present invention will be discussed. In a so-called picture memorandum function using an image or images picked-up by means of camera as memorandum, the memory for the picture memorandum is provided, upon registering image for the picture memorandum in the memory, picture memorandum icon is generated automatically upon initial registration to display as desktop icon, and upon subsequent registration of the picture memorandum, images are registered in the memory sequentially in association with the icon without generating further icon. Therefore, the picture memorandum can be registered easily.

Upon reading out the picture memorandum, one of the picture memorandum is read out and displayed on the waiting screen image by selecting the picture memorandum icon among the desktop icons on the waiting screen image. When the user wants to select the desired picture memorandum, other registered picture memorandum is displayed sequentially one by one in response to cursor operation to permit selection of the desired picture memorandum easily.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be understood more fully from the detailed description given hereinafter and from the accompanying drawings of the preferred embodiment of the present invention, which, however, should not be taken to be limitative to the invention, but are for explanation and understanding only.

In the drawings:

Fig. 1 is a functional block diagram showing the preferred embodiment of the cellular telephone set according to the present invention;

Fig. 2 is a flowchart showing operation of picture memorandum registration operation in the preferred embodiment of the cellular telephone set according to the present invention;

Fig. 3 is a flowchart showing operation of picture memorandum registration operation in the preferred embodiment of the cellular telephone set according to the present invention;

Fig. 4 is an illustration showing an example of display in a display portion in the cellular telephone set; and

Fig. 5 is a flowchart showing operation of picture memorandum reading out operation in the preferred embodiment of the cellular telephone set according to the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention will be discussed hereinafter in detail in terms of the preferred embodiment of a cellular telephone set, an operation control method therefor and a program therefor according to the present invention with reference to the accompanying drawings. In the following description, numerous specific details are set forth in order to provide a thorough understanding of the present invention. It will be obvious, however, to those skilled in the art that the present invention may be practiced without these specific details.

Fig. 1 is a functional block diagram showing the preferred embodiment of the cellular telephone set according to the present invention. Referring to Fig. 1, an operating portion 1 is a key operating portion where various operation keys are arranged. A display portion 2 is formed from an LCD (liquid crystal display unit) and is consisted of a main LCD and a subsidiary (back side) LCD. The main LCD is provided at a position in opposition to

the user, and the subsidiary LCD is provided at a position on back side of the main LCD. A display control portion 3 performs display control of the display portion 2 consisted of the main LCD and the subsidiary LCD.

5 The control portion 4 is a CPU and performs control for respective portions shown in Fig. 1. For this purpose, the control portion 4 performs control for respective portion by operation according to procedure of a program stored in ROM 12. A camera 5 is mounted on the same surface with the subsidiary
10 LCD and is controlled by a camera control portion 6. A radio portion 7 has a function for performing radio communication with a radio base station (not shown). Respective of these portions are mutually connected through buses 13.

 In Fig. 1, memories 8 to 12 illustrated lower side of the
15 bus 13 are storage medium, wherein the memory 8 for picture memorandum is the memory to be used in the present invention and will be discussed in detail later. The memory for album 9 is a memory for storing the images picked-up by the camera 5 for album. The memory 10 for waiting screen image is a memory
20 for storing waiting screen images. A working memory 11 is a work memory to be used in the process of CPU 4. It should be noted that ROM 12 is a read-only memory storing program for operating CPU 4.

 In Fig. 1, the memory 8 for picture memorandum is a memory
25 to be used for registering the images picked-up by the camera as memorandum and is provided separately from the memory 9 for usual album. The memory 8 for picture memorandum becomes active when a picture memorandum function is selected to register the

picked-up image. A size (capacity) of the picked-up image of the memory 8 is the same as a size of the waiting screen image (as stored in the memory 10 for the waiting screen image) and has a fixed zooming magnification. It should be noted that the
5 waiting screen image is a given fixed size. Therefore, the memory 10 for the waiting screen image has a fixed capacity. On the other hand, the picked-up images to be stored in the memory 9 for album have a plurality of kinds of sizes and have variable zooming magnification similarly to the prior art.

10 Figs. 2 and 3 are flowcharts showing operation upon selecting the picture memorandum function in the preferred embodiment of the present invention. In a condition where a menu is displayed on the display portion 2 (step S1), if the user selects "camera" (step S2), a sub-menu is displayed in response thereto (step
15 S4). It should be noted that, when a mode other than "camera" is selected at step S2, selected process is performed (step S3).

In the condition where the sub-menu is displayed, when the user selects "picture memorandum" (step S5), check is made whether
20 eight desktop icons are already registered or not in response thereto (step S7). The desktop icon is various icons 22 to be displayed on a lower portion of the display image portion 21 as shown by example of display in Fig. 4. Due to restriction in the display portion 2, eight icons can be registered at the maximum, for example. Therefore, when eight already registered
25 icons are present, newly registering the icon for picture memorandum becomes impossible. Therefore, checking at step S7 is performed. If the answer at step S7 is YES, an alert message, such as "desktop is full and no further icon can be attached"

is displayed (step S9). It should be noted that, at step S5, if a mode other than "picture memorandum" is selected, selected mode of process, such as picking-up of normal picture is performed (step S6).

5 At the same time, check is performed whether the already registered images in the memory 8 for picture memorandum are ten or less (step S8). In the memory 8 for the picture memorandum, ten images can be registered at the maximum, for example, due to limitation of memory capacity. Therefore, judgment is made
10 at step S8. If the answer at step S8 is positive (YES), alarm message "picture memorandum is full and cannot be registered any further", is displayed (step S9). It should be noted that at steps S7 and S8, if the answers in these steps are both positive (YES), alarm message indicating that picture memorandum is full
15 is displayed preferentially.

When answers at steps S7 and S8 are both negative (NO), operation mode transits to a camera view mode for picking-up picture memorandum (step S10), and the image size is fixed at the waiting screen image size (step S11). Then, switching of
20 finder of the subsidiary LCD provided on the back surface is disabled (step S12). The reason is that during active state of picture memorandum function, picking-up of image of the object, such as time-table or the like, is performed by directing the camera on the same surface with the subsidiary LCD on the back
25 surface, and at this time, the main LCD forming the display image portion 21 of the display portion 2 shown in Fig. 4 serves as the function of the finder.

Next, check is performed whether the picture memorandum is already registered (in the memory 8 for the picture memorandum) (step S13). If not registered, picking up of the image by the camera is performed (step S14). The picked-up image is then registered in the memory 8 for picture memorandum (step S15). At this time, since registration to the memory 8 for the picture memorandum (picture memorandum registration) is the first time, a picture memorandum icon (title is picture memorandum) is generated automatically at this timing and an icon 22 is additionally attached to the lower portion of the display image portion 21 shown in Fig. 4 (step S16).

This picture memorandum icon is an icon indicating that the picture memorandum is registered in the memory 8 for the picture memorandum. Upon subsequent registration of the picture memorandum, icon generation is not performed, and the picture memorandum icon generated upon registration of the picture memorandum at the first time, is used for registration of the picture memorandum up to maximum number of registration of picture memorandum determined depending upon capacity of the memory 8. Accordingly, with the picture memorandum icon, ten picture memorandum at the maximum can be registered in the memory 8 in association with the icon.

Since the maximum number capable of register as picture memorandum is ten, checking of the registration number is performed (step S17). When registration number reaches ten, as long as operation for termination of picture memorandum is not performed (step S18), picking-up of next picture memorandum

and registration process are continued (process of steps S20, S21, S17 and so forth).

In the foregoing step S13, if picture memorandum registration is performed, as set forth above, the picture memorandum icon generated before (step S16) is displayed using as it is (step S19). Subsequently, processes at steps S20 and S21 are performed. If number of registration of the picture memorandum exceeds ten at the maximum, the alarm message "picture memorandum is full and cannot be registered" and so forth is displayed (step S22).

Operation for reading out and seeing the picture memorandum registered as set forth above, is shown in the flowchart of Fig. 5. Referring to Fig. 5, during display of the waiting screen image (step S31), when the picture memorandum icon is selected by the user among icons 22 attached on the lower portion of the display image portion 21 of Fig. 4 (step S32), the image of the first picture memorandum is read out from the memory 8 for the picture memorandum in response to the user's selection and is displayed overlaying over the display image portion 21 (see Fig. 4) of the waiting screen image (step S33).

Upon retrieving picture memorandum desired by the user, by operating a cursor key (key with arrow mark directed up, down and left, right), the image corresponding to the picture memorandum registered in the memory 8 for picture memorandum is displayed on the waiting screen image one by one according to movement of the cursor (step S35). By stopping cursor operation when the picture memorandum desired by the user is displayed, desired picture memorandum is displayed on the waiting

screen image. In response to clear operation (step S36), display is returned to the waiting screen image (step S37), and then process is terminated.

It should be noted that by deleting the image in the memory
5 8 for the picture memorandum, the operation mode transits to a camera view mode upon picking-up of picture memorandum (step S10).

As set forth above, in the picture memorandum function, in which the image picked-up by the camera is used as memorandum,
10 the memory for the picture memorandum is provided. Upon registering the image for the picture memorandum in the memory for the picture memorandum, and upon initial registration, the icon for picture memorandum is generated automatically to display as the desktop icon. Upon subsequent registration of the picture
15 memorandum, icon generation is not performed, and images are sequentially registered in the memory for the picture memorandum in association with the initially generated icon. Therefore, load on CPU may not be increased upon registration of the picture memorandum, and operation to be performed by the user can be
20 quite simple.

On the other hand, upon reading out the picture memorandum, by operating the picture memorandum icon among the desktop icons in the waiting screen image, the registered image of one picture memorandum is displayed on the waiting screen image.
25 Subsequently, when the user has desired picture memorandum to see, the registered images are read out sequentially by using the cursor key. Therefore, operation to be performed by the user upon reading out the image from the picture memorandum,

can be quite simple. Furthermore, by providing the memory 8 for the picture memorandum separately from the album memory, picking-up of the picture memorandum becomes possible irrespective of the use condition of the memory 9 for album.

5 By this, capacity of the memory 8 for the picture memorandum can be fixed to make it unnecessary to perform a process for dynamically adjusting memory region for using with the memory 9 for album.

It should be appreciated that, in the foregoing embodiment,

10 the maximum number of the images to be registered in the memory 8 for the picture memorandum is ten and the maximum number of the desktop icons to be attached on the display image portion is eight. However, these numbers are considered as mere examples and can be selected arbitrarily. On the other hand, the

15 embodiment shown in Fig. 1 is designed to provide the memory 8 for picture memorandum and the memory 9 for album mutually independent of each other, it may also be possible to form these memories with a single memory with dividing into a plurality of regions. Similar is true in the case of the memory 10 for

20 the waiting screen image. Furthermore, the image to be read out from the memory 8 when the picture memorandum icon is selected, is not specified to the first image registered at first but can be other image.

Processes shown in Figs. 2, 3 and 5 may be preliminarily

25 stored in ROM 12 in a form of program or programs, and can be executed by CPU with reading out the program or programs.

It is the first effect of the present invention that operation of registration of the image (picture memorandum) picked upon

as memorandum, is simple and load of CPU can be reduced. The reason is that picture memorandum icon is generated and displayed automatically only for the image to be registered initially, and generation of icon is not performed for registering the icon.

5 Also, no particular registering operation is required for the user.

It is the second effect of the present invention is to make of operation for registered picture memorandum and operation for extracting desired picture memorandum among a plurality of picture memorandum. The reason is that the first picture memorandum can be read out on the waiting screen image only by selecting the picture memorandum icon among the desktop icons on the waiting screen image and the desired picture memorandum can be extracting by only operation of the cursor key.

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It is the third effect of the present invention to enable registration of a plurality of picture memorandum without increasing number of desktop icons. The reason is that a plurality of picture memorandum can be registered only with single icon.

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Although the present invention has been illustrated and described with respect to exemplary embodiment thereof, it should be understood by those skilled in the art that the foregoing and various other changes, omission and additions may be made therein and thereto, without departing from the spirit and scope of the present invention. Therefore, the present invention should not be understood as limited to the specific embodiment set out above but to include all possible embodiments which can

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be embodied within a scop encompassed and equivalent thereof
with respect to the feature set out in the appended claims.